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The non-academic impact of international development research in UK Higher Education

Analysis using the REF 2014 impact case studies

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Prepared for the UK Collaborative on Development
Sciences (UKCDS)

Policy Research Paper

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1 | Background to the report

This report is based on a short study investigating the nature of impact relating to international development arising from research in UK Higher Education Institutions (HEIs) and prepared for the UK Collaborative on Development Sciences (UKCDS) - a group of 14 UK government departments and research funders working in international development.¹ There are two areas of interest to UKCDS that have prompted this study:

1. The impact of UK HEI research arising from studies supported by the Department for International Development (DFID)
2. The impact of UK HEI research impact case studies that relate to the topic ‘international development’ more generally

This report builds on the Policy Institute at King’s prior analysis of the full set of 6,679 non-redacted impact case studies submitted to the 2014 Research Excellence Framework (REF).² The REF is a new system for assessing the quality of research in UK HEIs and is a process of expert review. HEIs made submissions to 36 Units of Assessment (UOAs) with submissions being assessed by an expert sub-panel within each UOA, working under the guidance of four main panels, A to D (Table 1). The impact case study is part of each submission and outlines the non-academic changes and benefits arising from academic research. Each case study consisted of five sections (summary, underpinning research, references to the research, details of the impact, and sources to corroborate the impact). Both this and our previous work used a mix of text-mining and qualitative techniques to analyse the text written in the impact case studies provided by these submissions from HEIs. The analysis reported here is based on the database and coding framework developed in our previous study², and focuses specifically on impact case studies that mention DFID and those relating to the topic ‘international development’.

Table 1: Units of Assessment (UoAs) and respective Panels for REF 2014

Panel A: Life Sciences	UoA 1	Clinical Medicine
	UoA 2	Public Health, Health Services and Primary Care
	UoA 3	Allied Health Professions, Dentistry, Nursing, Pharmacy
	UoA 4	Psychology, Psychiatry, Neuroscience
	UoA 5	Biological Sciences
	UoA 6	Agriculture, Veterinary and Food Science
Panel B: Engineering and Physical Sciences	UoA 7	Earth Systems and Environmental Sciences
	UoA 8	Chemistry
	UoA 9	Physics
	UoA 10	Mathematical Sciences
	UoA 11	Computer Science and Informatics
	UoA 12	Aeronautical, Mechanical, Chemical and Manufacturing Engineering
	UoA 13	Electrical and Electronic Engineering, Metallurgy and Materials
	UoA 14	Civil and Construction Engineering
	UoA 15	General Engineering
Panel C: Social Sciences	UoA 16	Architecture, Built Environment and Planning
	UoA 17	Geography, Environmental Studies and Archaeology
	UoA 18	Economics and Econometrics
	UoA 19	Business and Management Studies
	UoA 20	Law
	UoA 21	Politics and International Studies
	UoA 22	Social work and Social Policy
	UoA 23	Sociology
	UoA 24	Anthropology and Development Studies
	UoA 25	Education
Panel D: Arts and Humanities	UoA 26	Sport and Exercise Sciences, Leisure and Tourism
	UoA 27	Area Studies
	UoA 28	Modern Languages and Linguistics
	UoA 29	English language and Literature
	UoA 30	History
	UoA 31	Classics
	UoA 32	Philosophy
	UoA 33	Theology and Religious Studies
	UoA 34	Art and Design: History, Practice and Theory
	UoA 35	Music, Drama, Dance and Performing Arts
	UoA 36	Communication, Cultural and Media Studies, Library and Information Management

2 | Methods

2.1 Identification of case studies: Keyword searches and topic modelling selection

Two searches were conducted to find the sample of case studies to read:

1. Searching for keywords related to the Department for International Development (DFID), and associated organisations. The following keywords were used with the results of their individual searches shown in brackets: “Department for International Development” (n=131); DFID (n=193); DFID* (n=194); UKAID (n=3); “UK Aid” (n=6); “Independent Commission for Aid Impact” (n=2); ICAI (n=1); ICAI* (n=2); and R4D (n=1) “Overseas Development Administration” (n=3); ODA (n=16); and ODA* (n=22). The search was conducted across the whole body of the text in the full set of 6,679 non-redacted case studies and resulted in 246 case studies (noting that some case studies had duplicate mentions of the above keywords).
2. Extracting impact case studies that related to the topic ‘international development’, as coded by our previous work using topic modelling which had identified 60 topics.^a ‘International development’ was one of the 60 topics we had identified through this method. This resulted in 176 case studies identified for further reading.^b

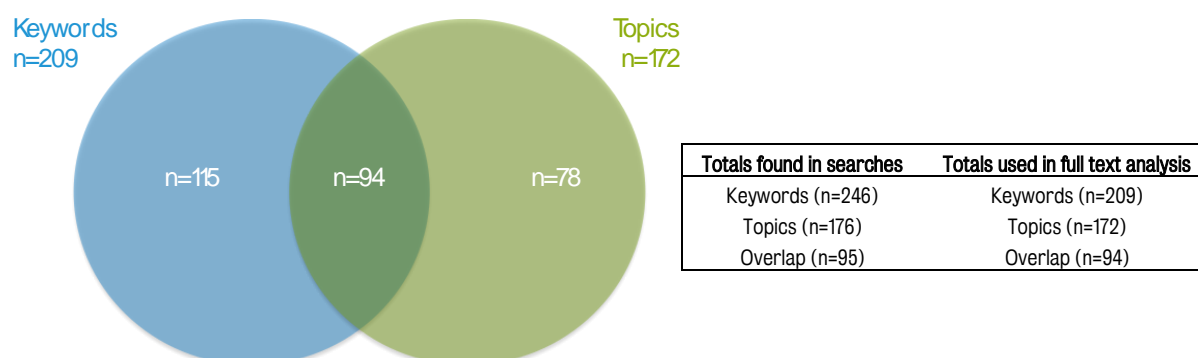
A total of 327 impact case studies were included in the sample for full qualitative analysis in this study, arising from both the keyword search (n=246) and the topic search (n=176). The overlap between the two was relatively small (n=95) - this may mean that a large proportion of researchers conducting work in the sphere of international development did not mention DFID in their case study (see Section 3 ‘Caveats and limitations’), that there may be a large body of work in international development outside of DFID funded work or simply that the modelled topic does not encompass the majority of DFID relevant case studies. This reinforces the value of using both search approaches to find a better range of studies relating to international development.

On reading this sample, we identified a number of false positives (see also Section 2.2) resulting in 287 studies included in the analysis. Figure 1 shows the number of studies used in the full qualitative analysis.

^a Topic modelling is the statistical analysis of a corpus of documents, in this case the ‘Details of the impact’ (Section 4) of the 6,679 non-redacted impact case studies. We used Latent Dirichlet Allocation (LDA) to conduct the topic modelling analysis, which is the accepted state-of-the-art in topic modelling and is implemented in many standard toolboxes for machine learning. Topics are based on the frequency with which certain related words appear. We sorted the topics in ascending order of their weighted – is there a word missing here or should previous word be ‘weight’ rather than ‘weighted’? If latter, define what you mean by weight. - and read the top nine words loading on each topic to apply a label or topic to that cluster of words. The top nine words related to the ‘international development’ topic were: *develop, country, intern, world, africa polici, global, govern and african*. For more background information relating to topic modeling and the methods used please refer to our previous work forming the basis of this analysis.

^b Each of the 6,679 non-redacted impact case studies were tagged by the topic modeling tool by its most prominent topic, ordered by weight or prominence of that topic in the text. For this study, we used the case studies tagged by ‘international development’ as either the most prominent or second most prominent topic, in order to capture the breadth of case studies that may not otherwise have been identified through topic modeling. Please note that in our previous work we had tagged case studies up to the third most prominent topic, which had resulted in 275 studies tagged with the topic ‘international development’. The rationale for choosing only the first and second most prominent topic was to ensure a manageable number of impact case studies to read.





Figure 1: Number of impact case studies used in full text analysis



2.2 Development of an analytical framework and qualitative analysis

To develop a framework for subsequent analysis, we conducted a pilot analysis of a sample of the case studies generated from the aforementioned searches. To produce an appropriate sample size for this, a randomised selection of 60 case studies were chosen. Three researchers (SH, AK and LB) each read 20 case studies and compared notes to establish consistency in coding. The preliminary themes identified were then discussed with UKCDS and a final set of themes for analysis agreed (see Box A), which form the basis of the headline findings. All 327 case studies were then distributed among the three researchers for full reading and analysis. On reading these, 40 were found to be ‘false positives’ ie had no mention of DFID or related organisations (if found via keyword search) or any relation to international development (if found via topic modelling search), leaving 287 impact case studies for full analysis.

Box A: Themes of interest

-  Sector in which impact took place
-  Mechanisms and pathways for achieving impact
-  Beneficiaries of impact
-  UKCDS member organisation involvement

3 | Caveats and limitations

There are 3 important caveats to this work. These limitations do not undermine the analysis presented here but help to frame its interpretation.

As noted in our previous work, the impact case studies have been written for assessment, rather than analysis, purposes. They therefore represent a very selective set of impacts, compiled with a specific set of ‘rules’ as defined in the REF guidance documents.³⁻⁴ The full set of case studies from which we drew our sample do not represent all instances of impact on any particular topic across UK HEIs. Furthermore, researchers were not required to mention funders within these impact case studies. This means that other impact case studies may also have been supported or had an impact on DFID and partner organisations, but not mentioned by the researchers and hence not picked up by the keyword search.

A second challenge lies in the way the case studies were written and captured through the REF exercise. Researchers were required to write the description of the impact of their research in free text. Much of the information captured for analysis purposes is inconsistently described, especially quantitative information. Therefore, while we have been able to describe types of impact qualitatively, conclusions noting the scale of impact (eg number of beneficiaries affected, return on investment figures) were not possible in the time and with the data available.

Finally, there are also limitations to topic modelling used to identify the studies tagged by ‘international development’. Topic modeling is a probabilistic approach and therefore the output can be slightly different each time the analysis is run. In addition, the quality of the model depends on the number of topics specified and how well suited this number is to the data. In practice, this means that there may still be a marginal proportion of case studies that relate to international development among the full set not picked up via topic modeling. Given these limitations, the primary use of topic modelling was to identify general themes and patterns in the data, which then allowed for the identification of sets of case studies or text for further reading.

4 | Findings

The findings presented in this section are based firstly on the general characteristics of the case studies gathered in the initial sample (n=327), showing the distribution of case studies across different UOAs (Section 4.1) and their mentions of other countries (Section 4.2). The rest of the sections cover the findings gathered from the full qualitative analysis following the removal of false positives (n=287), showing the involvement of DFID (Section 4.3), the many sectors impacted by research in the case studies (Section 4.4), the channels and stages to achieve impact (Section 4.5), the beneficiaries of impact (Section 4.5) and the UKCDS collaborators mentioned in the case studies (Section 4.6).

4.1 Research mentioning DFID-related organisations was multi-disciplinary

Using the methods developed in our previous work², we analysed the distribution of UOAs within the case studies identified in our initial searches (before full analysis). Figure 2 shows how the case studies found via the keyword search are distributed across the four main panels and 36 UOAs. Figure 3 shows the same distribution but for the case studies tagged with the topic 'international development'. These figures highlight the diverse academic nature of the underpinning research that has had an impact on international development activity.^c

To aid interpretation the panels have been colour coded and different shades of the same colour used to indicate associated UOAs. For example, Panel A (representing clinical and health sciences) is brown with units 1–6 in different shades of the same colour. The size of the spokes in the impact wheel indicate the frequency with which that topic occurred in that UOA, in absolute numbers. For example, in Figure 3 the longest spoke is for UOA 24 (Anthropology and Development Studies), indicating that 32 case studies in that UOA were assigned to this topic in our search.

The impact wheels show significant international development activity arising primarily from Panel C (Social Sciences). For the case studies specifically mentioning 'DFID', there are a large proportion of case studies also arising from Panel A (Life Sciences).

^c These figures are intended to be illustrative of the distribution of case studies based on the initial sample gathered (n=327) and do not account for the false positives later discovered during the full qualitative analysis stage. Due to time constraints in producing this report it was not possible to re-commission the figures to reflect that change in sample.

Figure 2: Impact wheel from keyword search

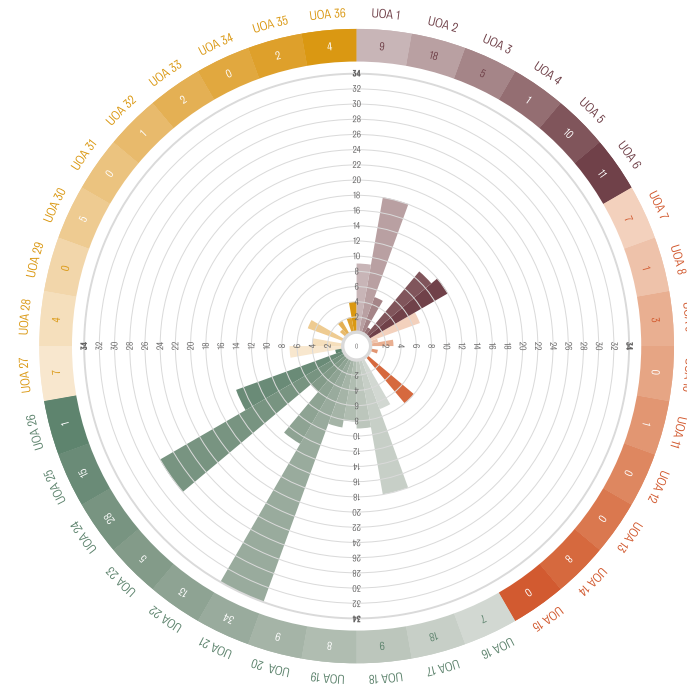
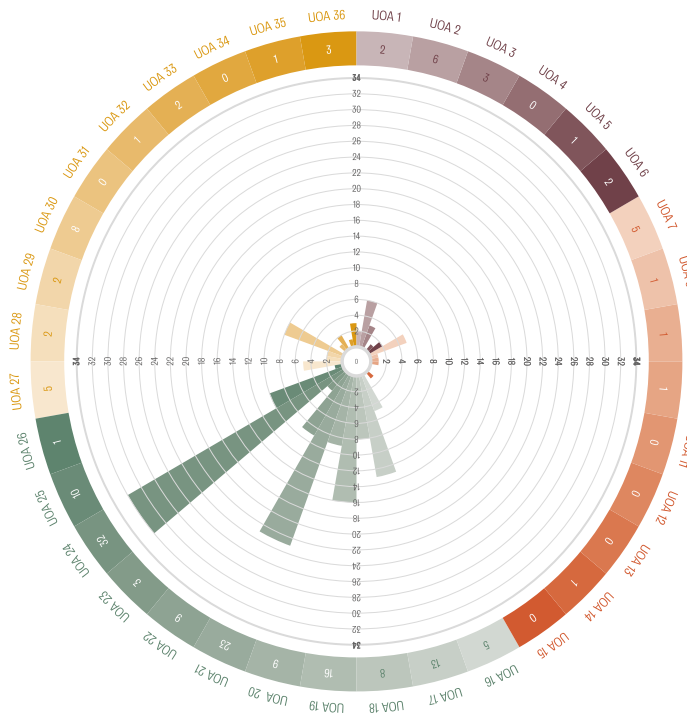


Figure 3: Impact wheel from topic ‘international development’



4.2 DFID and International Development research has had an impact on many countries

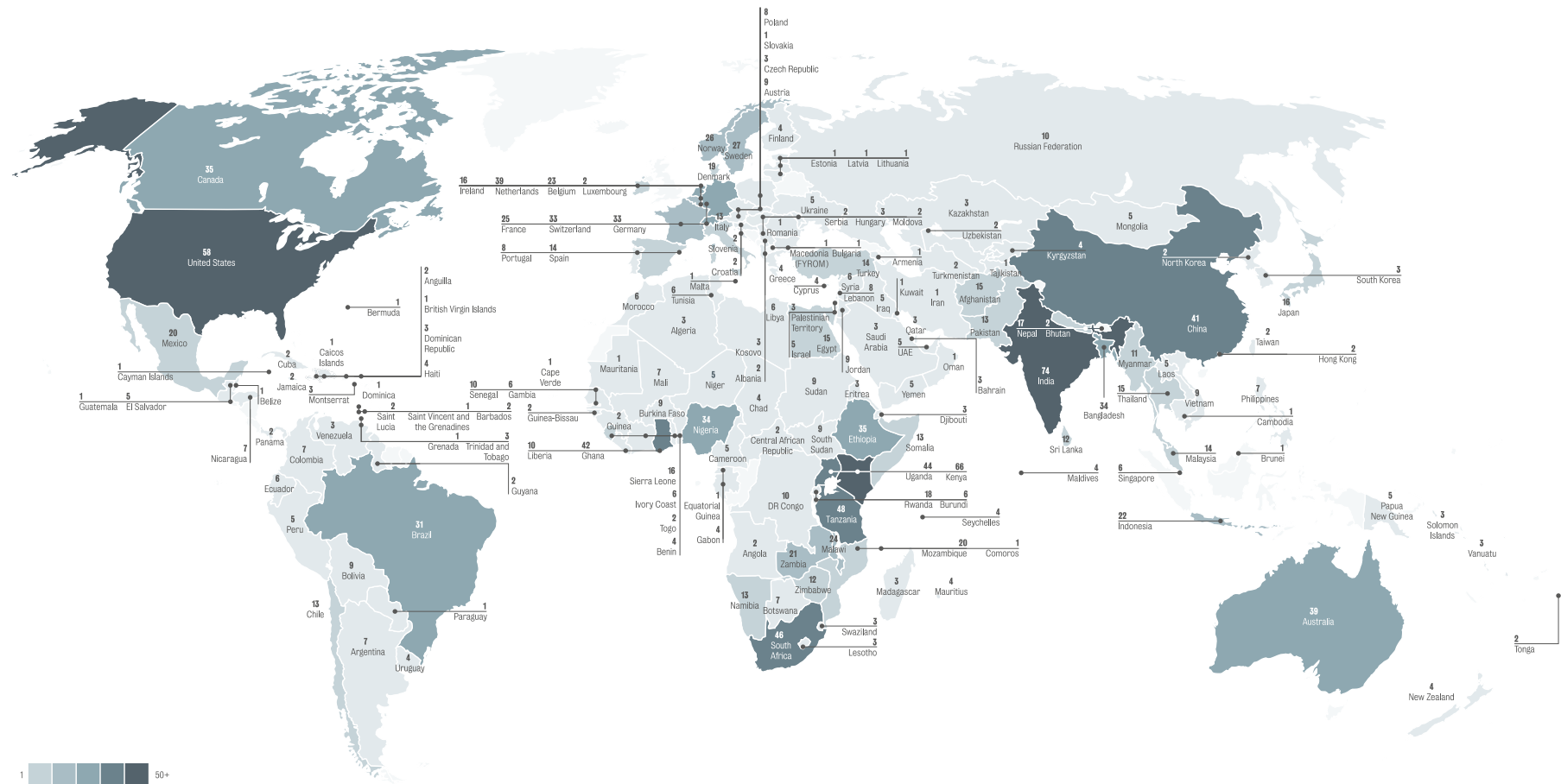
Figure 4 illustrates the geographical reach of the impact of research (outside the UK) from the sample of case studies identified in this study. The information was generated by combining information extraction of location names with a third-party database of geolocations (known as ‘geotagging’).^d Locations were tagged as either city, region or country and form part of the searchable online database⁵ of case studies developed by Digital Science. The information is at the country level, with cities and regions assigned to countries. We have captured the ten countries mentioned by the highest number of case studies in Table 2 (a total of 175 countries were tagged at least once).

Table 2: Top 10 countries mentioned by the 327 REF 2014 impact case studies identified in this study

Country	Number of case studies
India	74
Kenya	66
United States	58
Tanzania	48
South Africa	46
Uganda	44
Ghana	42
China	41
Australia	39
Netherlands	39

^d Text was passed through the DBpedia Spotlight service (<https://github.com/dbpedia-spotlight/dbpedia-spotlight/wiki>) to search for named entities and linked to the GeoNames database (www.geonames.org/). Any countries, top-level administrative regions or cities with a population of more than 15,000 were tagged.

Figure 4: Countries tagged relating to international development



4.3 UK HEI research has both contributed to, and been supported by, DFID

We sought to identify the ways in which DFID was involved in the underpinning research in the impact case studies, either as supporters/funders of the research or as the beneficiary of the impact. A total of 90 impact case studies claimed to have had an impact on DFID, either by engaging with their stakeholders or influencing policy and strategy (the details of how such engagement occurs are explored further in Section 4.5).

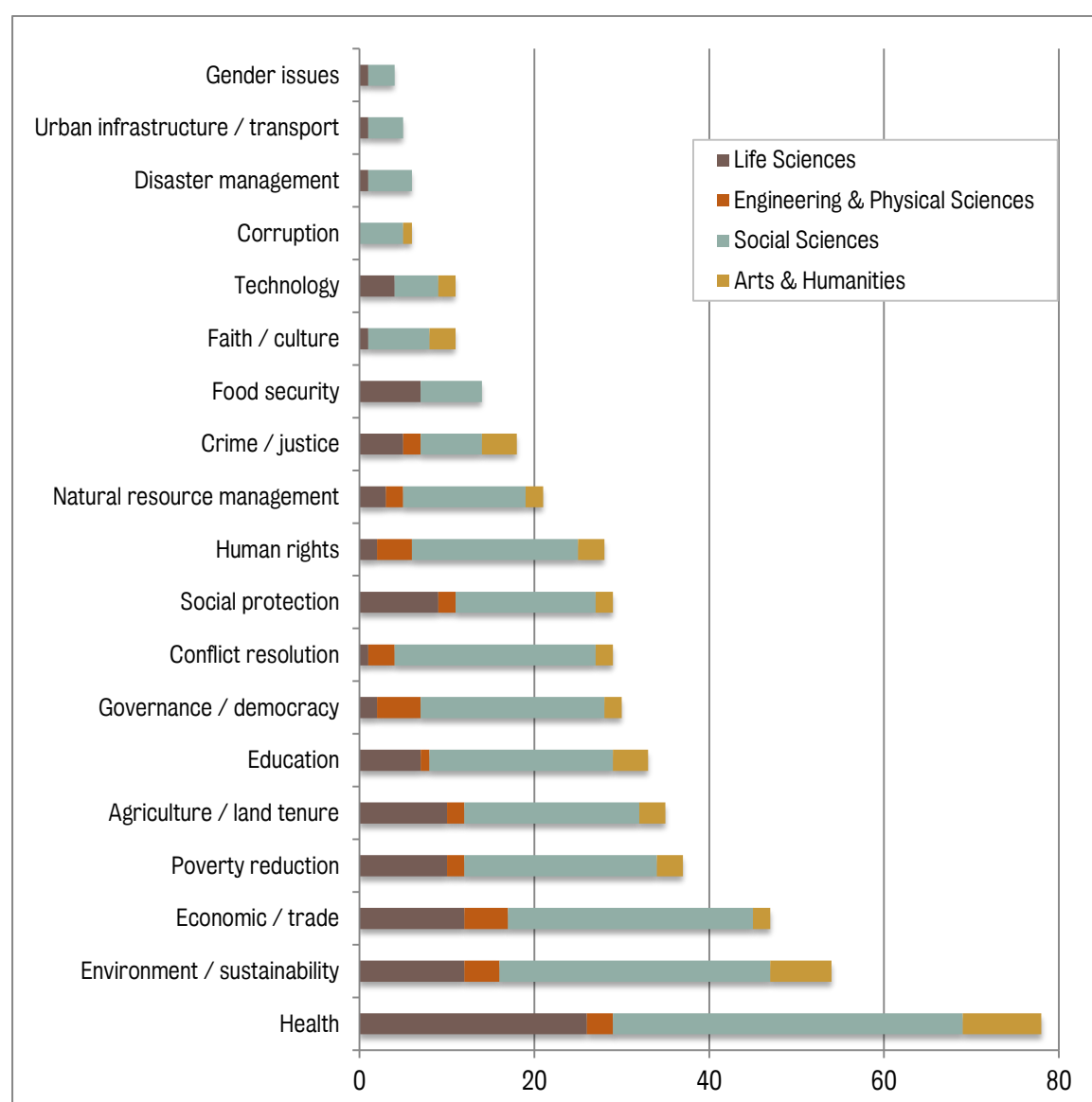
Given that researchers were not required to mention the source of their funding in these impact case studies, it is expected that in the majority of the case studies this was unspecified. However, we did find that a large proportion of the case studies read have mentioned DFID as the funder for the research either in the form of a grant or fellowship scheme (n=123). We caveat also that DFID may have been involved in the research in more than one way, and this distinction may not always have been clearly described by the researchers. A smaller number of case studies noted DFID as having provided infrastructure funding, such as in the form of a research centre support (n=4) or as having acted as a collaborator for the research (n=1), without further mention of funding.

4.4 DFID and International Development research has had an impact on multiple sectors

Figure 5 shows the range of the sectors that have been impacted by UK HEI research, as coded by the researchers in their subjective analysis (see Section 2.2). These categories are not mutually exclusive and researchers referred to various sectors when describing the impact of their work. Most case studies noted an impact on 2 or 3 sectors, with only a few noting more than 4.

We have also indicated in this chart the panels from which these case studies appear (Life Sciences, Engineering and Physical Sciences, Social Sciences, and Arts and Humanities). It is interesting to note that 'health' is the most common type of impact (n=78) but over half of the underpinning research comes from disciplines outside of Panel A (Life Sciences). This emphasises the inter-disciplinarity of the work conducted in this field. An example of this is an impact case study from UOA24 (Anthropology and Development Studies) where DFID funded research into improving financial access to healthcare in low income countries has influenced debate and policy. Notably, the researcher's evaluation of the maternal fee exemption policy in Ghana raised serious concerns about the funding, implementation and sustainability of the policy and contributed to a revision of the policy with financial protection of pregnant women ultimately being transferred to the National Health Insurance Scheme (NHIS) in 2008. In the first year of implementation alone, 433,000 additional women had access to health care.

Figure 5: Range of sectors



4.5 Researchers used different channels to achieve impacts at different stages

Researchers noted a variety of channels employed to achieve the impacts described in the case studies. These included interventions, such as delivering a new public health service or implementing a programme in a school (n=108), capacity building activities, such as workshops or training programmes (n=125), or use of media to communicate research findings or highlight the outcomes of its implementation (n= 50).

We were also interested in identifying the extent to which the research described produced an impact, and, if not, where the research was along a pathway towards achieving impact. We classified these stages as: (a) engaging with policy makers or disseminating evidence (eg via a conference or presentation), (b) evidence cited (eg in policy document), (c) research implemented or adopted (into changes in policy or practice), and (d) outcomes observed after implementation. The number of impact case studies tagged along these different stages are shown in Figure 6.

Figure 6: Stages towards achieving impact



Note: categories are not mutually exclusive and stages are non-linear

It must be noted that the relative contribution of each of these channels and stages to achieving impact is diverse, non-linear, and highly context-specific. For instance, evidence in some case studies from the health or science sector may have been cited in policy documents and involved the engagement of policy makers, while in another example, research was directly disseminated through stakeholder engagement and a book later adopted into university curricula. We therefore present examples that give an indication of the breadth of impacts achieved, alongside activities that have supported their delivery.

Example 1: Reforming China's reproductive health and family planning policies

In 2002-3, DFID supported research at the University of Southampton to evaluate a United Nations Population Fund (UNFPA) pilot programme to improve Chinese peoples' access to quality client-centred reproductive health and family planning services. The research – which used population surveys and field-based methods such as interviews and focus groups – identified gaps in service standards at a grassroots level and recommended reconfiguration of the UNFPA programme. It provided the basis for high-level policy dialogue and underpinned subsequent scaling up of the UNFPA pilot by the Chinese government, who from 2008 opted to introduce an informed choices model of family planning across the country.

A survey in 2010 showed improved practices and a shift in attitudes among health providers, with the removal of birth quotas in 85% of counties and a 43% reduction in induced abortions compared to 2003. Integrating family planning and health systems had enhanced awareness of contraceptive choices, with more women and couples free to make decisions without coercion or influence from health providers. The extension of the UN programme has meant that 754 million Chinese men and women of reproductive age now have access to family planning methods of their choice. DFID have since invited the lead researcher to examine whether lessons from China could be adopted for their programmes in countries such as Sierra Leone and Rwanda.

Sector: Health, Human rights

Beneficiaries: Women/girls, Policymakers, Development professionals

Channels: Actual intervention, Capacity building activity

Stages to impact: Engagement (dissemination), Evidence cited (informed policy / strategy), Implemented (into programme / practice), Outcomes observed (on beneficiaries)

Example 2: New approaches to mangrove conservation in Kenya

In partnership with the Natural Environment Research Council and Economic and Social Research Council, since 2009 DFID has funded a series of programme grants at Edinburgh Napier University to protect coastal mangrove ecosystems in Kenya. The work combined an innovative local development project with research to quantify carbon flows, establish the importance of mangroves forests as fish nurseries and explore the processes of ecosystem recovery in areas devastated by industrial wood extraction.

Based on the research, and working with local government departments, the team developed pioneering legal instruments to enable – for the first time – designation of mangrove forests as a Community Forest Association. In parallel, a locally-managed charity (Plan Vivo) acted as a route for international funding via a carbon credit scheme. The programme has provided a template for further community-based projects, with over 20 hectares of degraded land restored and more than 10,000 mangrove trees planted. Local scientists have been trained to PhD level, and with international funding, have progressed to Kenyan government and academic positions.

Sector: Agriculture/land tenure, Environment/sustainability, Natural resource management, Governance/democracy

Beneficiaries: Businesses, Local workforce, Policymakers, Development professionals

Channels: Actual intervention, Capacity building activity, Media

Stages to impact: Engagement (dissemination), Evidence cited (informed policy/strategy), Implemented (into programme/practice), Outcomes observed (on beneficiaries)

Example 3: Protection and welfare of children in post-conflict and development settings

Between 1997 and 2003, a broad-reaching collaboration involving DFID as one of number of other governmental and charitable partners supported research into child welfare at the University of East London. Focusing on issues around foster care, social work and family reunification, the research sought to improve the protection, participation and wellbeing of children in the aftermath of conflict and in the context of urban and rural poverty.

By involving international policymakers, NGOs and social work professionals, the research has influenced national policy in Rwanda. Findings are reflected in Rwanda's 2011 Strategic Plan for the Integrated Child Rights Policy, which frames the social care of 1 million children. Recommendations from the research have been incorporated into professional standards (eg UNICEF's training materials for staff working with children in post-conflict emergency contexts) and best practice for development workers (eg Save the Children's Alternative Care in Emergencies toolkit). The research has also informed more mainstream social care in the UK, as well as expert testimonies in immigration appeals in the USA.

Sector: Conflict resolution, Human rights, Social protection

Beneficiaries: Children, Policymakers, Development professionals

Channels: Actual intervention, Capacity building activity

Stages to impact: Engagement (dissemination), Evidence cited (informed policy/strategy), Implemented (into programme/practice)

Example 4: Mobile learning to improve English language practices in a global context

As one of two major funders of work at the Open University investigating the impact of mobile telephony on learning, DFID has underpinned significant improvement in the teaching of English in Bangladesh. The research combined field trials of low-cost models of mobile phone equipment in rural settings and a scalable school-based implementation model – the ‘trainer in your pocket’.

The research has been delivered via partnerships with the government of Bangladesh, BBC Media Action, two local NGOs and the University of Dhaka. Already, it has impacted on the educational practices of 4,690 teachers, who have access to preloaded resources such as audio and video clips aligned with local needs. Its success has led to establishment of a similar national programme in Nigeria, with ambitions that over 10 million primary and secondary school children will have benefitted by 2017.

Sector: Education, Technology

Beneficiaries: Businesses, Children, Development professionals

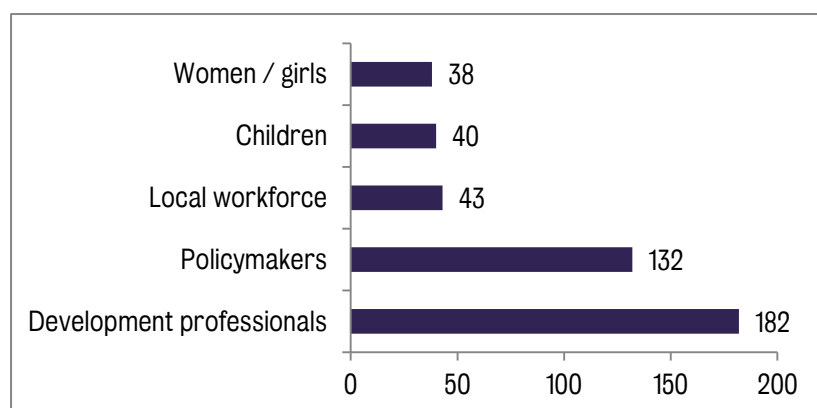
Channels: Actual intervention, Capacity building activity

Stages to impact: Engagement (dissemination), Evidence cited (informed policy/strategy), Implemented (into programme/practice), Outcomes observed (on beneficiaries)

4.6 Beneficiaries ranged from policymakers and development professionals to women, children and marginalised groups

While the REF assessment form did not include a specific section for describing beneficiaries, many of the researchers noted the many beneficiaries of their research. Figure 7 shows common beneficiaries cited in the impact case studies and include children, women and the local workforce. We also noted that a large number of case studies noted their impact on development professionals (eg through the researchers’ engagement with development agencies and individuals) or policymakers (such as those in a policy decision-making capacity in the target country or decision-makers in the UK working on development issues).

Figure 7: Selected beneficiaries noted by the impact case studies

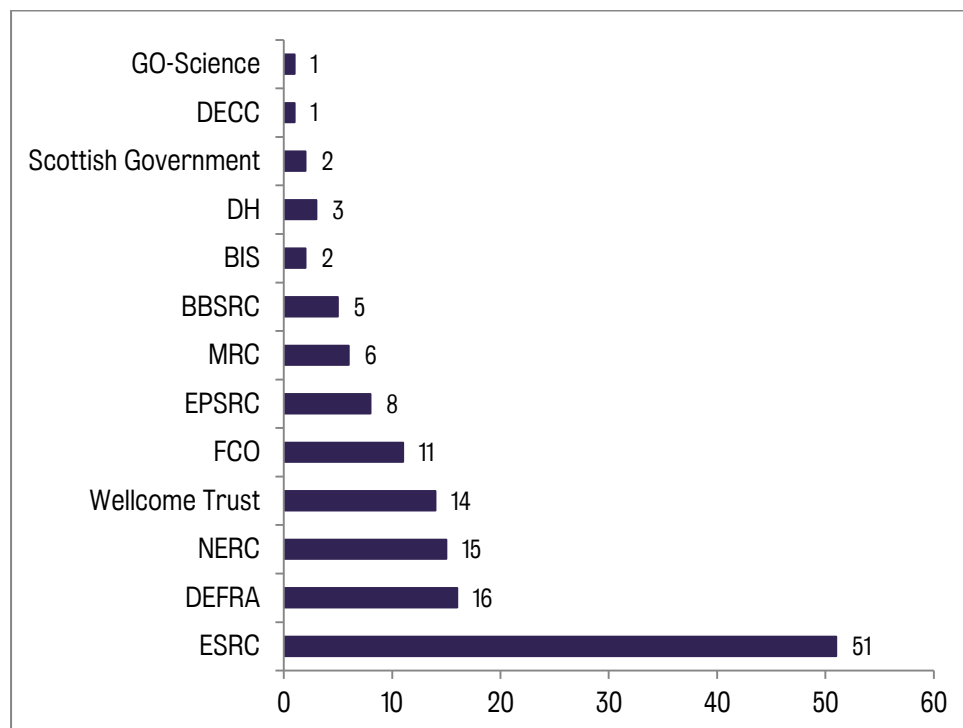


4.7 Involvement of UKCDS member organisations has helped to deliver a number of substantive impacts

Finally, we sought to identify the range of UKCDS member organisations^e, other than DFID, that have been mentioned in the case studies as supporting, influencing or been impacted by the research described in the impact case studies. We note again that researchers were not required to include funder or collaborator information in these case studies, therefore there may have been many more collaborations that had led to the impact described. Figure 8 shows that the organisation mentioned in the most number of case studies was the ESRC (n=51), usually as a funder or co-funder of the research, followed by DEFRA (n=16), NERC (n=15) and the Wellcome Trust (n=14).

We also specifically looked for mentions of these organisations within the 123 case studies that were tagged as funded by DFID (Section 4.3) and found that 48 out of these 123 case studies mentioned one or more of these organisations as either a collaborator or funder of research.

Figure 8: UKCDS member organisations support impact case studies on international development



^e UKCDS member organisations are: Biotechnology and Biological Sciences Research Council (BBSRC); Department for Business, Innovation and Skills (BIS); Department of Energy and Climate Change; Department for Environment Food and Rural Affairs (Defra); Department of Health (DH); Department for International Development (DFID); Economic and Social Research Council (ESRC); Engineering and Physical Sciences Research Council (EPSRC); Foreign and Commonwealth Office (FCO); Government Office for Science (GO-Science); Medical Research Council (MRC); Natural Environmental Research Council (NERC); Scottish Government; The Wellcome Trust.

5 | Concluding reflections



The analysis shown here presents a snapshot of the range and nature of impact that research in UK HEIs has had on international development activity globally. Given that the analysis is based on the impact case studies that were selected for submission to the REF 2014 assessment, they may under-represent the full extent of impact in this field.

Research contributing to international development comes from many disciplines beyond development studies and has had an impact on many countries. Researchers have also noted the impact of their research on DFID and other development institutions (eg World Bank, UN bodies) and policymakers. Beneficiaries ranged from policymakers and development professionals to women, children and marginalised groups.

The sectors that have been affected by the research described in the impact case studies include, in particular, health, the environmental sector, the local economy and poverty reduction. We note that the most common type of impact recorded was in the area of health, including public health and health systems initiatives and access to health care, but these studies arose primarily from disciplines outside of the health and clinical science departments in UK HEIs.

In order to achieve these impacts researchers have used different channels at a number of stages, from engaging with policy makers and dissemination activities (eg conferences) to use of the media, and actual adoption into policy or practice. We emphasise that these processes were highly context-specific and seldom linear.

The material available in the text from these impact case studies provides a rich source for further analysis and we have identified areas that can be analysed further:

-  Researchers were not required to specify their grant information in the write up of their case studies. By tracking which research projects and respective HEIs were funded by DFID or other organisations of interest through a grants database, it would be possible to identify a fuller set of impact case studies supported by these organisations.
-  We have selected the topic 'international development' as the focus of this analysis. There are many other topics that could also have been investigated (eg 'climate change', 'infectious diseases control', or 'women, gender and minorities'). We note that case studies were tagged by more than one topic, and so our selected sample in this study will also have included some of these related topics, but future analysts may also wish to investigate the overlap between these different case studies found among them and thereby capture a wider spectrum of possible studies that have included international development work.

We encourage future analysts to use the database available on the REF website⁵ and the results of our topic modelling exercise to explore these areas further.

6 | References

[1] UK Collaborative on Development Sciences (UKCDS) website. <http://www.ukcds.org.uk/> (last accessed 30 April 2015).

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